

WHAT IS CLAIMED IS:

1. A method of closing a valve comprising:
moving the valve to a first position at a first speed, wherein the first position almost closes the valve but does not create an airtight seal; and
moving the valve to a second position which fully closes the valve at a second speed, wherein the first speed is faster than the second speed.

2. The method of Claim 1, further comprising applying a first signal to an actuator to cause the movement to the first position.

3. The method of Claim 1, further comprising applying a second signal to an actuator to cause the movement to the second position.

4. The method of Claim 1, further comprising positioning a valve plunger to touch a valve diaphragm when the valve is in the first position.

5. The method of Claim 4, further comprising squeezing the valve diaphragm closed during movement to the second position.

6. The method of Claim 1, further comprising applying a signal which causes the valve to fully open.

7. A precision controlled fast valve comprising:
a diaphragm;

a plunger which travels within a bonnet of the valve, wherein the plunger is adapted to engage the diaphragm to create a seal which closes the valve; and

a piezo actuator attached to the plunger, the piezo actuator adapted to receive control signals which define the distance and speed of travel of the plunger.

8. The precision controlled fast valve of Claim 7, wherein the plunger travels to a first position at a first speed, wherein the first position positions the plunger proximate to the diaphragm but does not create a seal.

9. The precision controlled fast valve of Claim 8, wherein the travel to the first position at the first speed is defined by a first control signal sent to the piezo actuator.

10. The precision controlled fast valve of Claim 8, wherein the plunger travels to a second position at a second speed, wherein the second position positions the plunger to engage the diaphragm and create a seal.

11. The precision controlled fast valve of Claim 10, wherein the travel to the second position at the second speed is defined by a second control signal sent to the piezo actuator.

12. The precision controlled fast valve of Claim 10, wherein the first speed is faster than the second speed.